

# PATENT SPECIFICATION

NO DRAWINGS

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## COMPLETE SPECIFICATION

NATIONAL REFERENCE  
LIBRARY OF SCIENCE  
AND INVENTION

### Seaweed Powder

I, ANDRE BOUCLET, a French citizen of 10 rue de Lesdiguières, Paris 4<sup>ème</sup>, France, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention is concerned with a powder derived from seaweed, and with compositions containing it.

Seaweed powders are known which are formed by crushing dried seaweed relatively coarsely so that the powder particles have a size of from about 30 to 500 $\mu$ . Conventional equipment, such as mills, crushers and pulverisers, which rely upon impact, percussion, friction, tearing, shearing or rolling between moving rigid members and the material to be treated are used to form such powders. The seaweed powders thus obtained predominantly or wholly consist of integral, i.e. undamaged, seaweed cells.

I have now developed a new seaweed powder which has considerably more enhanced properties than the seaweed powders available hitherto and which is essentially characterised by having a much smaller particle size and by being made up of fragmented cells.

According to the present invention, therefore, I provide a seaweed powder consisting of fragmented seaweed cells and the particles of which have sizes ranging from 0.1 to 5 $\mu$ . Because of the small size of its particles, the powder can be formed

into a colloidal dispersion in water and other liquids. This powder consists of debris of the cellular envelopes and of cell contents released by the bursting of the envelopes; it is very active since it contains in the free state the active products that are enclosed in the cellular envelopes in the known powders.

The powder according to the invention can be made by suspending coarsely crushed seaweed powder in a stream of gas which is then passed through a zone where the gas stream experiences a turbulent flow; as a result of impacts between the particles and of compression and expansion of the gas in the turbulent zone, the seaweed cells burst and release their protoplasm content. The particles have sizes ranging from 1 to 50 $\mu$ ; the largest can be recycled. Suitable apparatus for carrying out this process is, for example, that described in French patent specification 1,320,782 in the name of Societe Ultrafine.

The seaweed powder thus obtained is very fine and, when dispersed in water, gives a non-sedimenting colloidal dispersion. The powder contains all the constituent ingredients of the marine seaweed from which it has been derived and has very high trace element and amino-acid contents.

Analysis of the dry seaweed powder according to the invention gave the following results for the two seaweed families represented by *Laminaria* and *Fucus*.

[Price 4s. 6d.]



| DRY SEAWEEDS |  | LAMINARIA |       | FUCUS |
|--------------|--|-----------|-------|-------|
|              |  | Stem      | blade |       |
|              | organic substances                                 | 65.27     | 77.53 | 80.10 |
|              | water-soluble ashes                                | 28.64     | 17.91 | 15.62 |
| 5            | Ashes insoluble in water but soluble in dilute HCl | 5.72      | 4.37  | 3.54  |
|              | siliceous materials                                | 0.37      | 0.19  | 0.74  |
|              | Nitrogen   | 0.98      | 1.05  | 0.99  |
|              | <i>In the soluble ashes</i>                        |           |       |       |
| 10           | potassium  | 11.85     | 4.54  | 2.94  |
|              | sodium   | 4.98      | 5.09  | 4.25  |
|              | sulphur trioxide                                   | 1.78      | 2.35  | 5.47  |
|              | total of chlorine halogens                         | 11.13     | 6.56  | 3.24  |
|              | iodine   | 0.552     | 0.329 | 0.048 |
| 15           | <i>As % in the ashes</i>                           |           |       |       |
|              | potassium (K <sub>2</sub> O)                       | 33.73     | 19.90 | 14.95 |
|              | iodine   | 1.045     | 1.364 | 0.177 |

20 The amino-acid percentages found in the proteins are summarised in the following table

|    |               |        |
|----|---------------|--------|
|    | Alanine       | 5.4    |
|    | Arginine      | 9.4    |
|    | Asparagine    | 9      |
| 25 | Cystine       | traces |
|    | Glycine       | 5.4    |
|    | Glutamic acid | 11.2   |
|    | Histidine     | 1.6    |
|    | Isoleucine    | 3      |
| 30 | Leucine       | 5      |
|    | Lysine        | 6      |
|    | Methionine    | 0.4    |
|    | Phenylalanine | 2.6    |
|    | Proline       | 3.3    |
| 35 | Serine        | 3.5    |
|    | Threonine     | 3.3    |
|    | Tryptophane   | traces |
|    | Tyrosine      | 1.2    |
|    | Valine        | 3      |

40 A particularly useful feature of the novel seaweed powder according to the invention is its high content of trace elements, vitamins, proteins and amino acids. It is for this reason very suitable for introduction into foodstuffs in general, including dairy products, condiments, confectionery, chocolate, all flours and their derivatives, such as rusks, bread, biscuits, cakes and spaghetti and similar products.

50 The seaweed powder content of the foodstuffs mention can vary from 1 to 5% (by weight) or more.

55 The seaweeds used to make powders for incorporation in foodstuffs are subjected to various very thorough cleaning operations before being powdered. They are cut fresh, washed in fresh water, carefully brushed to remove all impurities, desalted, dried in the open air, crushed and given a

60 bacteriological check.

The seaweed powder according to the

invention, as well as having tonic and restorative properties, is also a good stabiliser in flours for bread or the like.

The novel seaweed powder according to the invention can also be introduced into animal feeds, for example simply by being mixed with the flours used for animal feeds. As a non-limitative example, there can be mentioned feeds having a seaweed powder content of from 2 to 5% for poultry, 2 to 5% for pigs, 5 to 10% for dairy cows, 1 to 2% for calves, 5 to 10% for horses and 1 to 2% for dogs and cats, and special feeds containing from 1 to 5% of seaweed powder for mink, breeding trout, pheasants and all game (percentages are by weight).

The novel powder according to the invention also has many possible use in cosmetology. It can be used in its initial powder form in all powdery cosmetic products in a proportion of from about 5 to 10% (by weight).

For use in other cosmetic products, a dispersion can be prepared from the seaweed powder. The dispersion can be formed, for example, from the following ingredients:

|                          |         |    |
|--------------------------|---------|----|
| sea water                | 1 litre | 90 |
| Laminaria-derived powder | 20g     |    |
| Fucus-derived powder     | 20g     |    |
| sodium iodide            | 3g      |    |
| chloramine               | 1g      |    |

The Laminaria and Fucus-derived powders are added to the sea water which has been heated to about 60°C, and the mixture is covered and left to steep for about 12 hours. The mixture is filtered on paper and the sodium iodide and chloramine are added to the filtrate. This basic dispersion is of use in the preparation of toothpastes, soaps, beauty creams, hair lotions and so on. The cosmetic products



obtained preferably contain from 5 to 20% (by weight) of active product, i.e. of seaweed powder according to the invention.

The following examples (in which percentages are by weight) are given by way

0 seawater dispersion (prepared  
as described above)

1 sea water

5 Stannopon

Stannocire

of illustration only:—

#### Example 1

A beauty cream was made by thoroughly blending together the following ingredients:

|        |                |
|--------|----------------|
| 100g ) |                |
| 750g ) |                |
| 150g ) | + perfume q.s. |
| q.s. ) |                |

1 An ointment-like beauty cream is obtained which is suitable for greasy and dry skins; it is an anti-wrinkle and revitalising cream and is active against blotchiness and cellulitis.

The formula just given can also be used in the preparation of beauty milks.

To prepare hair lotions and toilet waters, a seawater dispersion (prepared as described above) is used in association with appropriate aqueous or alcoholic excipients.

Soaps are prepared from the same formula as for the beauty cream, with the excipients required to obtain a lathery toilet soap.

Shampoos can similarly be formulated which contain about 10% of the seawater dispersion in association with the excipients required to obtain lathery shampoos.

Toothpastes are preferably prepared with a *Lithothamnion calcareum*-derived powder.

The particle size of the seaweed powder can vary from 0.1 to 5 $\mu$ . The particles are rounded and therefore do not irritate the gums nor scratch the tooth enamel. The *Lithothamnion calcareum*-derived powder is combined with equal weights of sea water and the seawater dispersion described above and to this mixture are added the additional ingredients required to obtain a foaming or non-foaming toothpaste. A very good quality toothpaste which whitens the tooth enamel and does not irritate the gums is obtained.

The novel seaweed powder according to the invention also has outstanding therapeutic properties in the treatment of rheumatic, skin and circulatory disorders. Powders used for this purpose are preferably derived from a mixture of from 80 to 90% of *Laminaria* and *Fucus* in equal proportions and from 20 to 10% of *Lithothamnion*. The powder according to the invention can be used in various ways, the most conventional being hot fresh-water or

seawater baths in which from about 25 to 50g of the powder have been dispersed.

The therapeutic effectiveness of such baths is much better than that of baths containing known seaweed powders. The reason for this is that conventional seaweed powders consist of dry seaweeds crushed to particles having a size of from about 200 to 500 $\mu$ . These conventional seaweed powders are enclosed in permeable bags which release to the bath water only the infusible substance, i.e. mainly pigments and chromatophores and a small amount of iodine and mineral salts, so that the patient's skin has no contact at all with the chemico-biological ingredients of the plant.

The novel seaweed powder according to the invention has very fine particles sized from 0.1 to 5 $\mu$  and makes a very good suspension directly in the bath water, and does not give rise to any sedimentation effect. Because the powder particles are so fine, the active elements make very good contact with the whole surface of the skin. Indeed, it can be said that osmosis and endosmosis phenomena occur, the active elements penetrating into the skin pores which the relatively high bath temperature has opened.

There are therefore two main reasons for the outstanding therapeutic activity of the seaweed powder according to the invention—first, the fact that the active principles of the seaweeds are free and not retained within cellular membranes, and second, the fact that, because of their fine particle size, these free active principles can enter the skin of a person having a hot bath.

The main therapeutic applications of the seaweed powder are in the treatment of rheumatism, arthritis, arthrosis, dermatosis, multiple sclerosis, circulatory affections, cellulitis, and the re-education of the physically handicapped.

The general action on the organism is excellent and is distinguished by stimula-



tion of all the organism's defence functions and means.

The seaweed powder can be used for children as well as for adults.

- 5 The following examples of clinical observation are given to illustrate the therapeutic properties of the seaweed powder.

**OBSERVATION No. 1**

- 10 A patient suffering from a violent haemorrhoidal crisis with inflammation of the anal and perianal region was treated in sitz baths containing lukewarm water. About 40g of the seaweed powder according to the invention was added to the bath water. The baths lasted for about 15 mins.

- 15 At the end of the first bath, the pain was considerably reduced and four baths were enough to make the symptoms disappear.

**OBSERVATION No. 2**

A cellulitic patient suffered from hyarthrosis during the menopause period.

- 20 She was treated by complete baths of 25 20 minutes duration every other day, the lukewarm water of the bath containing 50g of the seaweed powder according to the invention. The pain disappeared after the first few baths. After a week the size of her knees decreased. The patient seemed to "deflate" in general. Circulatory troubles due to her menopause, although they did not disappear completely, decreased considerably.

**OBSERVATION No. 3**

- 35 An 8-year old child suffered from an infectious skin allergy following vaccinations. Antibiotic and corticoid treatment already given to the child had had no result. In addition to the allergy, the child was in a cachectic and anorexic state with edematous manifestations.

- 40 The child was then given daily baths containing the seaweed powder according to the invention.

- 45 The result was spectacular; the infectious skin allergy disappeared completely in three weeks and the child regained its appetite and started to put on weight.

- 50 There was no relapse.

**OBSERVATION No. 4**

- A patient suffering from acute rheumatism in the spinal column and major articulations with locking of the sacro-iliac joints was given baths containing the seaweed powder according to the invention. There was an appreciable improvement from the very first baths. Continuation of the treatment with baths every other day cleared up the attacks completely.

- 60 In general, baths containing the seaweed powder according to the invention give rapid and lasting results in the treatment of all kinds of rheumatism—traumatic, 65 essential, acute or chronic—of the spinal

column and of the joints. Previously seaweed baths could only be considered to be useful adjuncts to chemico-therapeutic treatments of rheumatism.

Because of its high biochemical potential, the seaweed powder according to the invention is on its own an effective treatment for acute affections. It can be given with advantage in cases of patients having weak digestive tracts or who find intramuscular or intravenous injections difficult to take.

In addition to using the seaweed powder according to the invention alone in fresh water or sea water baths as described above, it can be used in combination with various other products suitable for dispersion in water, including lacto-serum, bran, sea salt and perfumes.

The seaweed powder can be formulated *inter alia* as a powder, as dispersible granules or as effervescent tablets.

Various pharmaceutical preparations can be formulated with the seaweed powder in combination with appropriate excipients and carriers, including seaweed muds, cataplasms and antiphlogistic pomades.

Seaweed mud is prepared as required by mixing the powder according to the invention with hot water. The powder is suitably derived from:

|               |     |
|---------------|-----|
| Lithothamnion | 10% |
| Laminaria     | 45% |
| Fucus         | 45% |

The effervescent tablets suitably contain 10g of powder in an effervescent vehicle.

Antiphlogistic pastes can contain 50% of powder derived from equal parts of Laminaria and Fucus, with a kaolin-glycerin carrier.

Embrocations suitably contain 10% of the active product and massage powders suitably contain 25% of the active product, the latter in each case being derived from

|               |     |
|---------------|-----|
| Laminaria     | 40% |
| Fucus         | 40% |
| Lithothamnion | 20% |

The seaweed powder according to the invention can also be formulated for internal use, *inter alia* in the form of dragées, solutions and infusions.

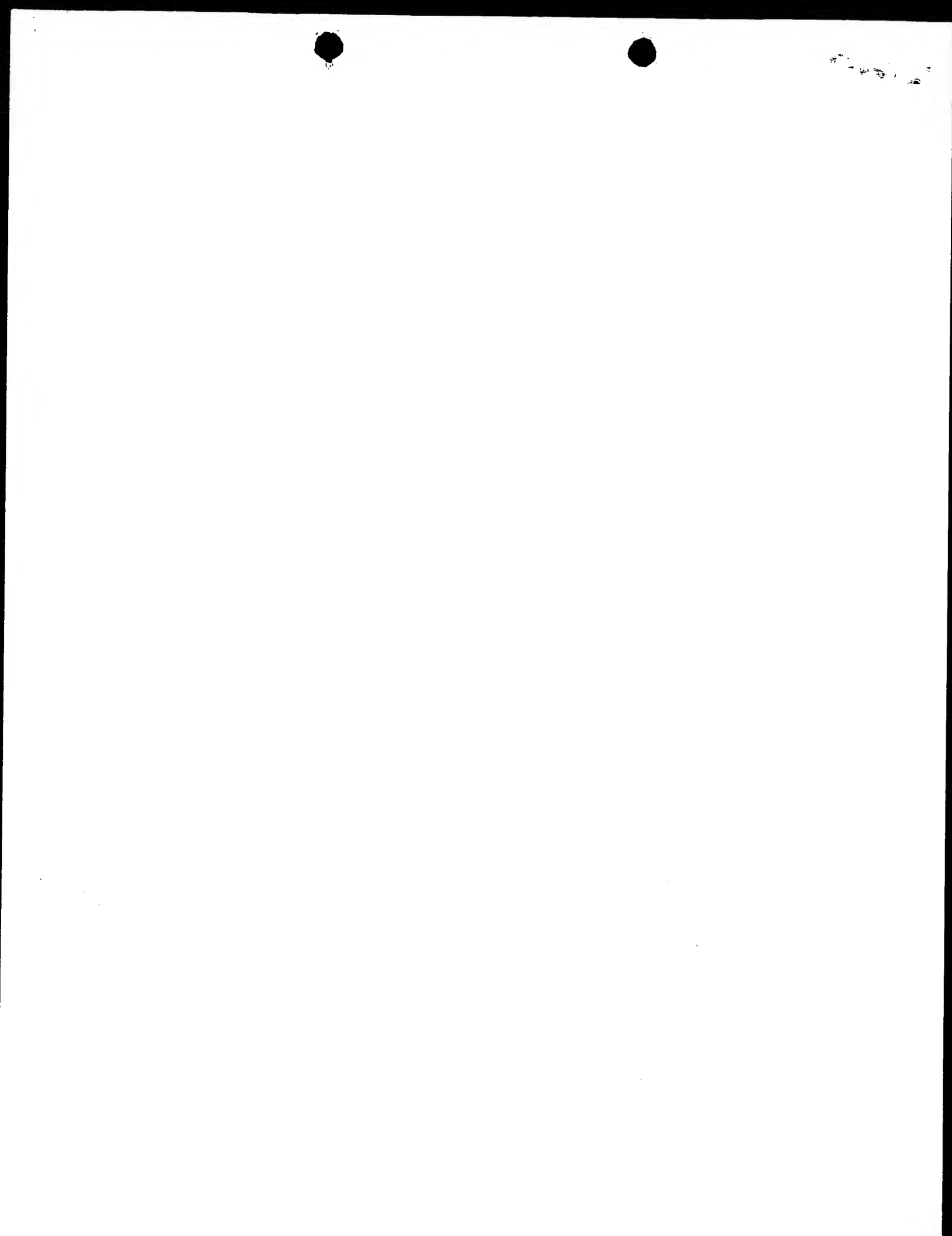
**WHAT I CLAIM IS:—**

1. A seaweed powder consisting of fragmented seaweed cells and the particles of which have sizes ranging from 0.1 to 5 $\mu$ .

2. A seaweed powder according to claim 1 which is derived from *Fucus*, *Laminaria* and/or *Lithothamnion calcareum* seaweed.

3. A foodstuff for human consumption containing from 1 to 5% by weight of seaweed powder according to claim 1 or 2.

4. An animal feedstuff containing from





1 to 10% by weight of seaweed powder according to claim 1 or 2.

5 5. A cosmetic product containing from 5 to 20% by weight of seaweed powder according to claim 1 or 2.

6. A pharmaceutical composition comprising seaweed powder according to claim 1 or 2 and an inert, physiologically acceptable carrier.

10 7. A composition according to claim 6

in the form of a powder, dispersible granules, effervescent tablets, seaweed muds, cataplasms, antiphlogistic pomades, embrocations, dragees, solutions or infusions.

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